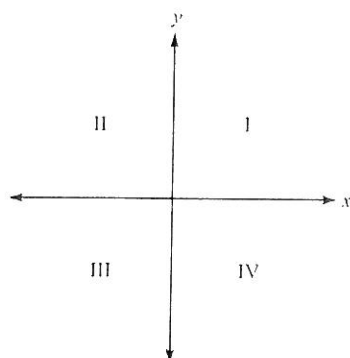


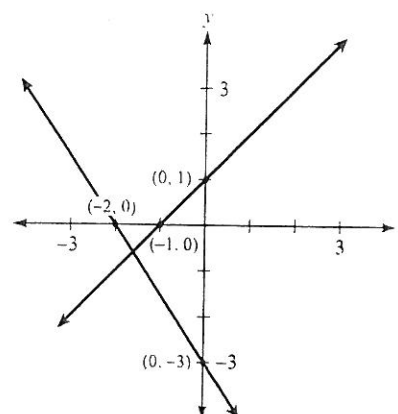
ACT Coordinate Geometry Problem Set 1

1. Point A is to be graphed in a quadrant, not on an axis, of the standard (x, y) coordinate plane below. If the x -coordinate and the y -coordinate of point A are to have the same signs, then point A *must* be located in:



- A. Quadrant I only
B. Quadrant II only
C. Quadrant III only
D. Quadrant I or II only
E. Quadrant I or III only
2. What is the x -coordinate of the point in the standard (x, y) coordinate plane at which the two lines $y = -2x + 7$ and $y = 3x - 3$ intersect?
- A. 10
B. 5
C. 3
D. 2
E. 1
3. What is the distance in the standard (x, y) coordinate plane between the points $(2, 3)$ and $(5, 5)$?
- A. 3
B. 5
C. $\sqrt{11}$
D. $\sqrt{13}$
E. $\sqrt{25}$
4. A circle in the standard (x, y) coordinate plane is tangent to the x -axis at 4 and tangent to the y -axis at 4. Which of the following is an equation of the circle?
- A. $x^2 + y^2 = 4$
B. $x^2 + y^2 = 16$
C. $(x - 4)^2 + (y - 4)^2 = 4$
D. $(x - 4)^2 + (y - 4)^2 = 16$
E. $(x + 4)^2 + (y + 4)^2 = 16$

5. Which of the following systems of inequalities is represented by the shaded region of the graph below?

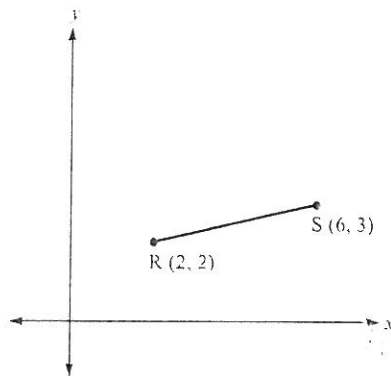


- A. $y \leq x + 1$ or $y \geq x - 3$
B. $y \leq x + 1$ and $y \geq x - 3$
C. $y \leq x + 1$ or $y \geq \left(-\frac{3}{2}\right)x - 3$
D. $y \leq x + 1$ and $y \leq \left(-\frac{3}{2}\right)x - 3$
E. $y \leq x + 1$ and $y \geq \left(-\frac{3}{2}\right)x - 3$
6. A triangle, $\triangle ABD$, is reflected across the y -axis to have the image $\triangle A'B'D'$ in the standard (x, y) coordinate plane: thus A reflects to A' . The coordinates of point A are (m, n) . What are the coordinates of point A' ?
- F. $(-m, n)$
G. $(m, -n)$
H. $(-m, -n)$
J. (n, m)
K. Cannot be determined from the given information.
7. In the standard (x, y) coordinate plane, point X has coordinates $(-4, 0)$ and point Y has coordinates $(0, -8)$. What are the coordinates of the midpoint of \overline{XY} ?
- A. $(-6, -1)$
B. $(-2, -4)$
C. $(0, 2)$
D. $(2, 4)$
E. $(6, -1)$
8. In the standard (x, y) coordinate plane, what is the slope of the line joining the points $(3, 7)$ and $(4, -8)$?
- A. -15
B. -1
C. $-\frac{1}{7}$
D. $\frac{21}{32}$
E. 15

9. What is the center of the circle with equation $(x - 3)^2 + (y + 3)^2 = 4$ in the standard (x, y) coordinate plane?
- $(3, 3)$
 - $(3, -3)$
 - $(\sqrt{3}, -\sqrt{3})$
 - $(-3, 3)$
 - $(-\sqrt{3}, \sqrt{3})$

10. In the standard (x, y) coordinate plane, what is the length of the line segment that has endpoints $(-3, 4)$ and $(5, -6)$?
- 9
 - $2\sqrt{41}$
 - 18
 - $20\sqrt{2}$
 - 40

11. The points $R(2, 2)$ and $S(6, 3)$ in the standard (x, y) coordinate plane below are 2 vertices of triangle RST , which has a right angle at S . Which of the following could be the third vertex, T ?



- $(5, 7)$
 - $(5, -5)$
 - $(4, 6)$
 - $(4, 9)$
 - $(4, \frac{9}{2})$
12. In the standard (x, y) coordinate plane, which of the following lines goes through $(3, 4)$ and is parallel to $y = 2x + 2$?
- $y = \frac{1}{2}x + 2$
 - $y = 2x - 2$
 - $y = 2x + 4$
 - $y = 2x + 10$
 - $y = 3x + 2$
13. What is the slope of a line that passes through the origin and the point $(-6, 2)$?
- 3
 - $\frac{1}{3}$
 - $-\frac{1}{3}$
 - 3
 - 6

14. What is the distance in the standard (x, y) coordinate plane between the points $(0, 1)$ and $(4, 4)$?
- $\sqrt{7}$
 - 3
 - 4
 - 5
 - $\sqrt{27}$

15. In the standard (x, y) coordinate plane, if the x -coordinate of each point on a line is 5 more than half the y -coordinate, what is the slope of the line?
- 5
 - $-\frac{1}{2}$
 - $\frac{1}{2}$
 - 2
 - 5

16. Given that $y - 5 = \frac{1}{2}x + 1$ is the equation of a line, at what point does the line cross the x axis?
- 15
 - 12
 - 1
 - 4
 - 6

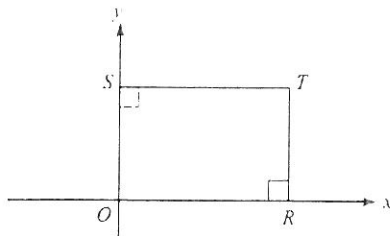
17. Which one of the following lines has the smallest slope?
- $y = x + 6$
 - $y = 2x + 10$
 - $y = \frac{1}{2}x - 1$
 - $5y = 15x + 4$
 - $7y = 3x - 7$

18. What is the equation of the circle in the standard (x, y) coordinate plane that has a radius of 4 units and the same center as the circle determined by $x^2 + y^2 - 6y + 4 = 0$?
- $x^2 + y^2 = -4$
 - $(x + 3)^2 + y^2 = 16$
 - $(x - 3)^2 + y^2 = 16$
 - $x^2 + (y + 3)^2 = 16$
 - $x^2 + (y - 3)^2 = 16$

19. When graphed in the standard (x, y) coordinate plane, the lines $x = -5$ and $y = x - 5$ intersect at what point?
- $(-5, -10)$
 - $(-5, -5)$
 - $(-5, 0)$
 - $(0, -5)$
 - $(0, 0)$

20. For some real number n , the graph of the line $y = (n + 1)x + 6$ in the standard (x, y) coordinate plane passes through $(4, 8)$. What is the value of n ?

A. $-\frac{3}{2}$
 B. $-\frac{1}{2}$
 C. $\frac{1}{2}$
 D. $\frac{3}{2}$
 E. 2



21. In the figure above, $OS = ST$ and the coordinates of T are $(k, 5)$. What is the value of k ?

F. -5
 G. -3
 H. -2
 J. 0
 K. 5

22. In the standard (x, y) coordinate plane, what are the coordinates of the midpoint of a line segment with endpoints $(-1, 3)$ and $(2, 5)$?

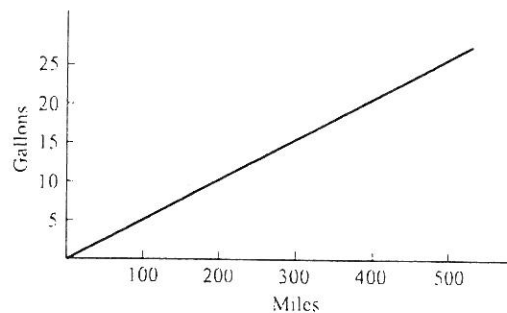
F. $(1, 8)$
 G. $(3, 2)$
 H. $(\frac{3}{2}, 1)$
 J. $(\frac{1}{2}, 4)$
 K. $(\frac{3}{2}, 4)$

23. For the 2 functions $f(x)$ and $g(x)$, tables of values are shown below. What is the value of $g(f(-1))$?

x	$f(x)$	x	$g(x)$
-3	-6	1	0
-1	2	2	3
1	-3	3	8
3	9	4	15

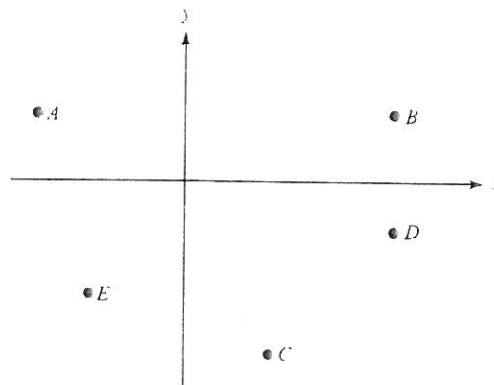
F. -3
 G. 0
 H. 2
 J. 3
 K. 8

24. The line graphed below shows the predicted gasoline use for a certain truck. Which of the following is the closest estimate of this truck's predicted rate of gasoline use, in miles per gallon?



A. 25
 B. 20
 C. 16
 D. 10
 E. 8

25. Which point in the standard (x, y) coordinate plane below has the coordinates $(2, -5)$?

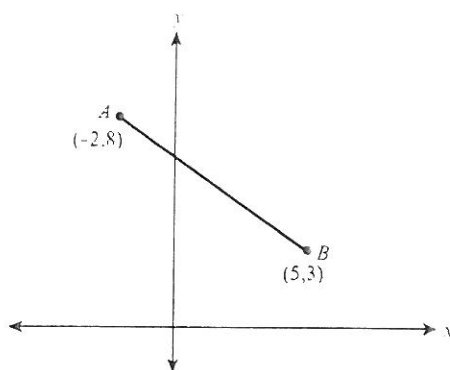


A. A
 B. B
 C. C
 D. D
 E. E

26. A line in the standard (x, y) coordinate plane is parallel to the x -axis and 5 units below it. Which of the following is an equation of this line?

A. $y = -5$
 B. $x = -5$
 C. $y = -5x$
 D. $y = x - 5$
 E. $x = y - 5$

27. In the standard (x,y) coordinate plane shown below, what is the distance on the y -axis, in units, from point A to point B ?



- F. -3
- G. -5
- H. 3
- J. 5
- K. 11

28. A circle in the standard (x,y) coordinate plane has center $(-4,5)$ and radius 5 units. Which of the following equations represents this circle?

- A. $(x - 4)^2 - (y + 5)^2 = 5$
- B. $(x - 4)^2 + (y + 5)^2 = 5$
- C. $(x - 4)^2 - (y + 5)^2 = 25$
- D. $(x + 4)^2 + (y - 5)^2 = 25$
- E. $(x + 4)^2 - (y - 5)^2 = 25$

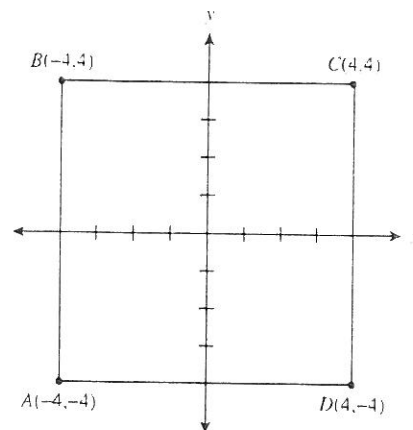
29. In the standard (x,y) coordinate plane, point B with coordinates $(5,6)$ is the midpoint of AC , and A has coordinates $(6,7)$. What are the coordinates of C ?

- A. $(11,13)$
- B. $(7,8)$
- C. $(4,5)$
- D. $(5.5,6.5)$
- E. $(-4,-8)$

30. In the standard (x,y) coordinate plane, how many times does the graph of $(x + 1)(x - 2)(x + 3)(x + 4)$ intersect the x -axis?

- A. 1
- B. 4
- C. 6
- D. 10
- E. 24

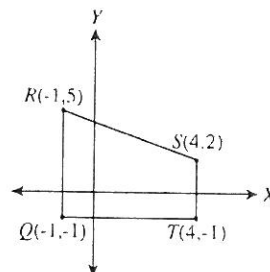
31. In the square graphed below, what is the slope of line segment AC ?



- A. 4
- B. 2
- C. 1
- D. -1
- E. -4

Use the following information to answer Questions 32–34.

Quadrilateral $QRST$ is shown below in the standard (x,y) coordinate plane. For this quadrilateral, $QT = 5$, $RS = \sqrt{34}$, $ST = 3$, and $RQ = 6$, all in coordinate units.



32. What is the length of QS in coordinate units?

- F. $\sqrt{34}$
- G. $\sqrt{10}$
- H. $\sqrt{8}$
- J. 8
- K. 4

33. Which of the following are the coordinates of the image of R under a 90° counterclockwise rotation about the origin?

- A. $(5,-1)$
- B. $(1,5)$
- C. $(1,-5)$
- D. $(-1,-5)$
- E. $(-5,-1)$

34. Which of the following is closest to the perimeter of quadrilateral $QRST$, in coordinate units?

- F. 26.0
- G. 22.5
- H. 19.8
- J. 15.0
- K. 14.0